RADIO TEST REPORT

Test Report No. : 12685243S-C-R1

Applicant	:	**JVC KENWOOD Corporation**
Type of Equipment	:	**GPS NAVIGATION SYSTEM**
Model No.	:	**DNX419DABS**
Test standard	:	**EN 303 413 V1.1.1**
Test Result	:	**Complied (Refer to Section 3.2)**

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
6. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
7. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
8. The information provided from the customer for this report is identified in SECTION 1.
9. This report is a revised version of 12685243S-C. 12685243S-C is replaced with this report.

Date of test: February 5 and 6, 2019

Representative test engineer: K. Noda
Kazuya Noda
Engineer
Consumer Technology Division

Approved by : H. Shirasawa
Hikaru Shirasawa
Engineer
Consumer Technology Division

RTL02610

☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.
☒ There is no testing item of "Non-accreditation".

REVISION HISTORY

Original Test Report No.: 12685243S-C

Revision	Test report No.	Date	Page revised	Contents
- (Original)	12685243S-C	February 18, 2019	-	-
1	12685243S-C-R1	March 8, 2019	9, 10	Correction of “Configuration and peripherals”, “Description of EUT and Support equipment” and “List of cables used” in section 4.2

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SECTION 1: Customer information

Company Name	:	JVC KENWOOD Corporation
Address	:	2967-3, Ishikawa-machi, Hachioji, Tokyo 192-8525 Japan
Telephone Number	:	+81-42-646-5525
Facsimile Number	:	+81-42-646-1440
Contact Person	:	Seigo Tsutsumi

The information provided from the customer is as follows:
- Applicant, Type of Equipment, Model No. on the cover page and other relevant pages
- Section 1: Customer information
- Section 2: Equipment under test (E.U.T.)
- Section 4: Operation of E.U.T. during testing

* The laboratory is exempted from liability of any test results affected from the above information in Section 2 and 4.

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	GPS NAVIGATION SYSTEM
Model No.	:	DNX419DABS
Serial No.	:	Refer to Clause 4.2
Rating	:	DC 12 V
Receipt Date of Sample (Information from test lab.)	:	January 7, 2019
Country of Mass-production	:	Indonesia
Condition of EUT	:	Production prototype (Not for Sale: This sample is equivalent to mass-produced items.)
Modification of EUT	:	No Modification by the test lab

2.2 Product Description

Model: DNX419DABS (referred to as the EUT in this report) is a GPS NAVIGATION SYSTEM.

Clock frequency in the system: 6.2208 GHz (Maximum)

Similar Model

Model	Difference
DNX419DABS	Base
DNR4190DABS	None DVD Function
DNR3190BTS	None DVD Function, None DAB Function

Radio Specification

GNSS

Radio Type	:	Receiver
Frequency of Operation	:	See table below.
Antenna type	:	External Antenna
Antenna Gain	:	2 dBi

Supported GNSS and GNSS signals

GNSS	RNSS Frequency Band / Frequency [MHz]		
	1559 to 1610	1215 to 1300	1164 to 1215
BDS	☐B1l 1561.098	-	-
Galileo	☐E1 1575.42	☐E6 1278.75	☐E5a 1176.45 ☐E5b 1207.14
GLONASS	☐G1 1598.0625 - 1605.375	☐G2 1242.9375 - 1248.625	-
GPS	☒L1 1575.42	☐L2 1227.6	☐L5 1176.45
SBAS	☒L1 1575.42	-	☐L5 1176.45

☒ Supported GNSS signal
☐ Not supported GNSS signal

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Radio : EN 303 413 V1.1.1

Title : Satellite Earth Stations and Systems (SES);
Global Navigation Satellite System (GNSS) receivers;
Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands;
Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Purpose of test : Compliance with the harmonized RE directive 2014/53/EU.

3.2 Procedures and results

Item	Test Procedure	Limit / Specifications	Remarks	Worst margin	Exclusions	Results
GUE adjacent frequency band selectivity performance	Clause 5.4.3 Clause 5.4.4	Clause 4.2.1.2	Conducted	-	N/A	Complied a)
Spurious emissions	Clause 5.5.2.1	Clause 4.2.2.2	Conducted	25.2 dB 7022.500 MHz	N/A	Complied b)
Spurious emissions	Clause 5.5.2.2	Clause 4.2.2.2	Radiated	10.5 dB 319.487 MHz, Vertical	N/A	Complied c)
Note: UL Japan, Inc.'s EMI Work Procedure 13-EM-W0420. a) Refer to APPENDIX 1 (data of GUE adjacent frequency band selectivity performance) b) Refer to APPENDIX 1 (data of Spurious emissions (Conducted)) c) Refer to APPENDIX 1 (data of Spurious emissions (Radiated))						
Symbols: Complied — The data of this test item has enough margin, more than the measurement uncertainty. Complied# — The data of this test item meets the limits unless the measurement uncertainty is taken into consideration.						

3.3 Additions or deviations to standards

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

Although this standard determines only the limit value of uncertainty, there is no applicable rule of uncertainty in this. Therefore, the following results are derived depending on whether or not laboratory uncertainty is applied.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor $k = 2$.

Shonan EMC Lab.

Substitution measurement (EUT height: 1.5 m, Distance: 3 m)	
Frequency range	Uncertainty (+/-)
30 MHz - 200 MHz	4.8 dB
200 MHz - 1000 MHz	3.6 dB
1 GHz - 12.75 GHz	4.3 dB

Antenna terminal test	Uncertainty (+/-)
Conducted emissions Measurement (below 1 GHz)	1.8 dB
Conducted emissions Power Density Measurement (1 GHz-3 GHz)	1.7 dB
Conducted emissions Measurement (3 GHz-18 GHz)	2.3 dB
GUE adjacent frequency band selectivity (Wanted RF Level)	1.99 dB
GUE adjacent frequency band selectivity (Blocking Signal Level)	2.15 dB

3.5 Test Location

UL Japan, Inc. Shonan EMC Lab.
1-22-3, Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
Telephone: +81 463 50 6400, Facsimile: +81 463 50 6401
JAB Accreditation No. RTL02610

Test site	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Maximum measurement distance
No.1 Semi-anechoic chamber	2973D-1	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.2 Semi-anechoic chamber	2973D-2	20.6 x 11.3 x 7.65	20.6 x 11.3	10m
No.3 Semi-anechoic chamber	2973D-3	12.7 x 7.7 x 5.35	12.7 x 7.7	5m
No.4 Semi-anechoic chamber	-	8.1 x 5.1 x 3.55	8.1 x 5.1	-
No.1 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.2 Shielded room	-	6.8 x 4.1 x 2.7	6.8 x 4.1	-
No.3 Shielded room	-	6.3 x 4.7 x 2.7	6.3 x 4.7	-
No.4 Shielded room	-	4.4 x 4.7 x 2.7	4.4 x 4.7	-
No.5 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.6 Shielded room	-	7.8 x 6.4 x 2.7	7.8 x 6.4	-
No.8 shielded room	-	3.45 x 5.5 x 2.4	3.45 x 5.5	-
No.1 Measurement room	-	2.55 x 4.1 x 2.5	-	-

3.6 Test data, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

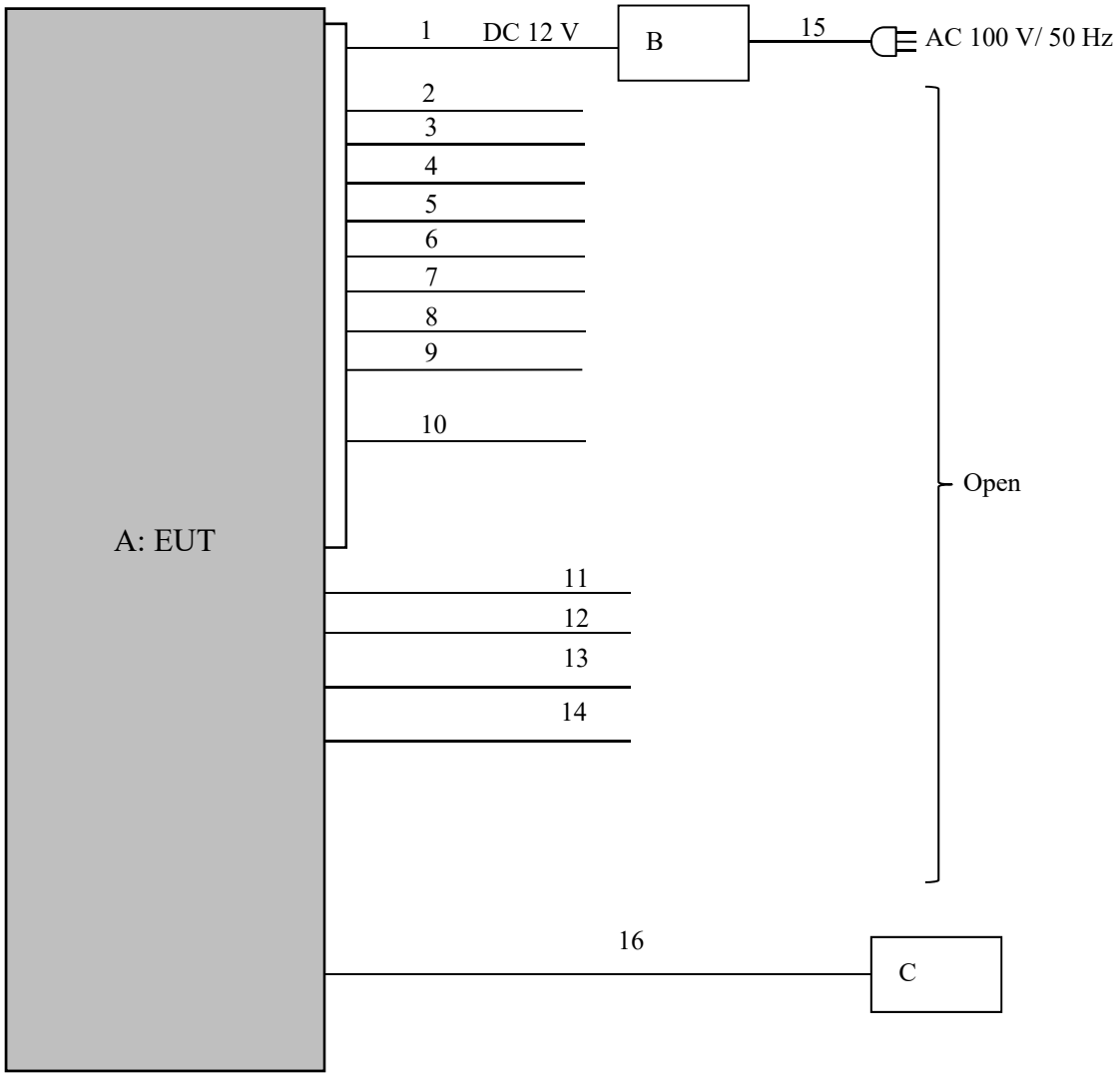
4.1 Operating Mode(s)

Mode	Remarks
GPS Receiving (Rx GPS)	-
SBAS Receiving (Rx SBAS)	-
*EUT has the power settings by the software as follows; - Software: SoC : 0.0.3209.4000 System : 1.0.0209.3100 Panel : 1.0.0159.3700	

Details of Operating Mode(s)

Test item	Operating mode	Tested frequency band *1)
GUE adjacent frequency band selectivity performance	Rx GPS Rx SBAS	L1 L1
Spurious emissions (Conducted / Radiated)	Rx (All GNSS)	GNSS Band
*1) See also “Supported GNSS and GNSS signals” on Section 2.2.		

4.2 Configuration and peripherals



* Cabling and setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	Remark
A	GPS NAVIGATION SYSTEM	DNX419DABS	PE-X0004	JVC KENWOOD Corporation	EUT
B	DC Power Supply	PAN35-10A	DE001677	Kikusui	-
C	GPS Antenna	-	-	JVC KENWOOD Corporation	-

List of cables used

No.	Name	Length (m)	Shield		Remark
			Cable	Connector	
1	DC (ACC, B+, GND)	2.0	Unshielded	Unshielded	-
2	Speaker	0.15	Unshielded	Unshielded	-
3	Speaker	0.15	Unshielded	Unshielded	-
4	Speaker	0.15	Unshielded	Unshielded	-
5	Speaker	0.15	Unshielded	Unshielded	-
6	ANT. CONT	0.15	Unshielded	Unshielded	-
7	P. CONT	0.15	Unshielded	Unshielded	-
8	ILLUMI	0.15	Unshielded	Unshielded	-
9	REMOTE CONT	0.15	Unshielded	Unshielded	-
10	MUTE	0.15	Unshielded	Unshielded	-
11	REAR VIEW CAMERA	0.2	Shielded	Shielded	-
12	VIDEO OUT	0.2	Shielded	Shielded	-
13	FM/AM Antenna	0.15	Shielded	Shielded	-
14	USB	0.2	Shielded	Shielded	-
15	AC	1.8	Unshielded	Unshielded	-
16	GPS	3.5	Shielded	Shielded	-

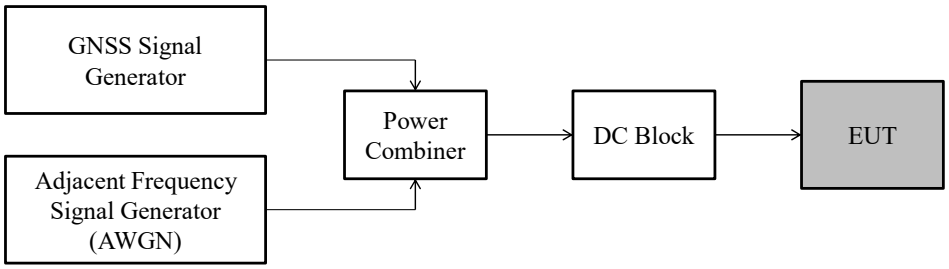
*1) Used for Antenna terminal conducted test.
*2) Used for Radiated Emission test.

SECTION 5: GUE adjacent frequency band selectivity performance

Test Procedure

1) Configured the GNSS signal generator to simulate those GNSS and GNSS signals declared as supported by the EUT, with power levels and other details as specified in clause B.2 of EN 303 413 V1.1.1.
2) With the adjacent frequency signal switched off, the EUT was given sufficient time to acquire all simulated satellites from the declared GNSS system(s).
3) Recorded the baseline C/N_0 value(s) reported by the EUT. Sufficient filtering was used to obtain a stable value. C/N_0 was averaged across all the satellites in view for each GNSS constellation. However, C/N_0 was not averaged across satellite signals in different GNSS constellations. For a multi-GNSS EUT, there is a separate C/N_0 value recorded for each GNSS constellation and each GNSS signal supported.
4) The adjacent frequency signal generator was configured to generate the signal defined in table 4-4 of the standard, at the first test point centre frequency and signal power level as specified in table 4-2 (for the 1559 MHz to 1610 MHz RNSS band) or table 4-3 (for the 1164 MHz to 1300 MHz RNSS band) of the standard.
5) The adjacent frequency signal was switched on, and the EUT's C/N_0 value(s) recorded as in step 3) to measure the degradation with respect to the baseline value(s) recorded in step 3).
6) Test point Pass/Fail Criteria: If the C/N_0 degradation from step 5) does not exceed 1 dB, then this test point was set to "pass". If the C/N_0 degradation exceeds 1 dB, then this test point was set to "fail." For a multi-GNSS and multi-signal EUT, there was a separate pass/fail determination for each GNSS and for each GNSS signal supported. If the C/N_0 degradation exceeds 1 dB for any supported GNSS or supported GNSS signal, then this test point was set to "fail".
7) Step 1) through step 6) were repeated for all test point centre frequencies (and associated signal power level) specified in table 4-2 (for the 1559 MHz to 1610 MHz RNSS band) or table 4-3 (for the 1164 MHz to 1300 MHz RNSS band) of the standard.

Test Setup



Adjacent Frequency Signal setting

Waveform	1 MHz bandwidth AWGN, according to Annex B.1 of the standard
Frequency	See Test data
Power level	See Test data

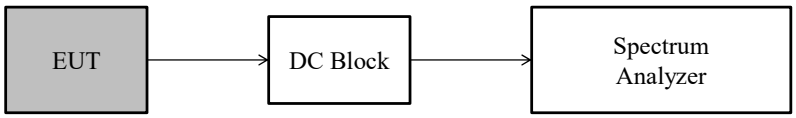
Test data : APPENDIX
Test result : Pass

SECTION 6: Spurious emissions (Conducted)

Test Procedure

The test was made with below setting connected to the antenna port.

Test Setup



Pre-check scan setting

Frequency	30 MHz - 1 GHz	1 GHz - 8.3 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	Peak, RBW: 100 kHz / VBW: 300 kHz	Peak, RBW: 1 MHz / VBW: 3 MHz
Trace mode	Max hold	Max hold

Peak detector and Max hold were applied as Worst-case measurement.

If any emissions identified during the sweeps above that fall within the 6 dB range below the applicable limit or above, individually measured using the procedure below and compared to the limits given in the standard.

Measured setting

Frequency	30 MHz - 1 GHz	1 GHz - 8.3 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	RMS, RBW: 100 kHz / VBW: 300 kHz	RMS, RBW: 1 MHz / VBW: 3 MHz
Span / Sweep time	Zero / 30 ms	Zero / 30 ms
Trace mode	Single sweep (Time domain band power)	Single sweep (Time domain band power)

The test results are rounded off to two decimals place, so some differences might be observed.
The equipment and cables were not used for factor 0.0 dB of the data sheets.

Test data : APPENDIX
Test result : Pass

SECTION 7: Spurious emissions (Radiated)

Test Procedure

1) EUT was placed on an urethane platform of nominal size, 0.5 m by 0.5 m raised 1.5 m above the conducting ground plane.
The Radiated Electric Field Strength intensity has been measured in semi anechoic chamber at a distance of 3 m. The measuring antenna height was varied between 1 m to 4 m and the turn table was rotated a full revolution in order to obtain the maximum value of the electric field strength.
The measurements were performed for both vertical and horizontal antenna polarization.

2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 1.5 m as the EUT. The frequency below 1 GHz of the Substitution Antenna was used the Half wave dipole Antenna, which was tuned the measured frequency in 1).
The frequency above 1 GHz of the Substitution Antenna was used Horn Antenna.
The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in 1) by means of varying the measuring antenna height between 1 m to 4 m to obtain maximum receiving level.
Its Output power of Signal Generator was recorded.

3) Below 1 GHz:
Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2).
For the usage of the Antenna except for the Half wave dipole Antenna for the Substitution Antenna, the Effective radiated power was calculated by compensating the finite difference in the Antenna gain of the Half wave dipole Antenna, and Substitution Antenna.
Above 1 GHz:
Equivalent isotropic radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the signal generator and the substitution antenna from the output power of the signal generator recorded in 2).
For the usage of the antenna (horn antenna) for the substitution antenna, the equivalent isotropic radiated power was calculated by compensating the finite substitution antenna.

Pre-check scan and Measured setting (PK)

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	Peak, RBW: 100 kHz / VBW: 300 kHz	Peak, RBW: 1 MHz / VBW: 3 MHz
Trace mode	Max hold	Max hold

Measured setting (RMS)

Frequency	Below 1 GHz	Above 1 GHz
Instrument used	Spectrum Analyzer	Spectrum Analyzer
IF Bandwidth	RMS, RBW: 100 kHz / VBW: 300 kHz	RMS, RBW: 1 MHz / VBW: 3 MHz
Span	Zero	
Sweep mode	Single Sweep	
Sweep time	Tx: more than 120 % of the duration of the longest burst detected during the measurement of the RF Output Power Rx: 30ms	
Sweep points	Tx: Sweep time [μs] / (1 μs) with a maximum of 30 000 Rx: equal or more than 30 000	

- The noise levels were confirmed at each position of 0 deg. and 30 deg. of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise

	Frequency / Test / Antenna	Below 1 GHz	Above 1 GHz
Rx (All GNSS)	Horizontal	0 deg.	0 deg.
	Vertical	0 deg.	0 deg.

The test results are rounded off to one decimal place, so some differences might be observed.

Test data : APPENDIX
Test result : Pass

APPENDIX 1: Test data

GUE adjacent frequency band selectivity performance

Report No.	12685243S-C-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	February 6, 2019
Temperature / Humidity	21 deg. C / 31 % RH
Engineer	Shiro Kobayashi
Mode	Rx

Frequency band [MHz]	Test point center frequency [MHz]	Adjacent frequency signal power [dBm]	Measured C/N_0 [dB-Hz]				GNSS
			No interfering signal	With interfering signal	Decrease of C/N_0 [dB]	Result Decrease ≤ 1 dB	
1518 to 1525	1524	-65	-	-	-	N/A	BDS
			-	-	-	N/A	Galileo
			-	-	-	N/A	GLONASS
			37.0	37.0	0.0	Pass	GPS
			35.0	35.0	0.0	Pass	SBAS
1525 to 1549	1548	-95	-	-	-	N/A	BDS
			-	-	-	N/A	Galileo
			-	-	-	N/A	GLONASS
			37.0	37.0	0.0	Pass	GPS
			35.0	35.0	0.0	Pass	SBAS
1549 to 1559	1554	-105	-	-	-	N/A	BDS
			-	-	-	N/A	Galileo
			-	-	-	N/A	GLONASS
			37.0	37.0	0.0	Pass	GPS
			35.0	35.0	0.0	Pass	SBAS
1559 to 1610	RNSS band under test						
1610 to 1626	1615	-105	-	-	-	N/A	BDS
			-	-	-	N/A	Galileo
			-	-	-	N/A	GLONASS
			37.0	37.0	0.0	Pass	GPS
			35.0	35.0	0.0	Pass	SBAS
1626 to 1640	1627	-85	-	-	-	N/A	BDS
			-	-	-	N/A	Galileo
			-	-	-	N/A	GLONASS
			37.0	37.0	0.0	Pass	GPS
			35.0	35.0	0.0	Pass	SBAS

Decrease of C/N_0 = Measured C/N_0 (No interfering signal) - Measured C/N_0 (With interfering signal)

N/A: not applicable (No supported GNSS)
Test point center frequency and Adjacent frequency signal power: Specified in table 4-2 of the standard.

Applied GNSS signal level at the EUT antenna terminal

GNSS	Level [dBm]
GPS	-128.50
Galileo	-
GLONASS	-
SBAS	-131.00
BDS	-

Spurious emissions (Conducted)

Report No.	12685243S-C-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	February 6, 2019
Temperature / Humidity	21 deg. C / 31 % RH
Engineer	Shiro Kobayashi
Mode	Rx (All GNSS)

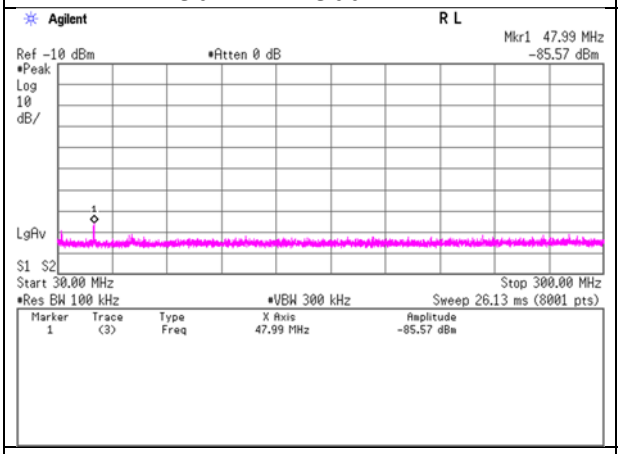
Reading		Loss		Result	Limit	Margin
Frequency [MHz]	Level [dBm]	Cable [dB]	DC Block [dB]	[dBm]	[dBm]	[dB]
47.990	-85.57	1.44	0.03	-84.09	-57.00	27.1
439.800	-91.09	1.54	0.05	-89.50	-57.00	32.5
933.050	-89.47	1.63	0.07	-87.77	-57.00	30.8
4665.500	-76.84	2.04	0.31	-74.49	-47.00	27.5
7022.500	-75.03	2.27	0.55	-72.21	-47.00	25.2

Result = Reading + Cable Loss (including the cable(s) customer supplied) + DC Block Loss

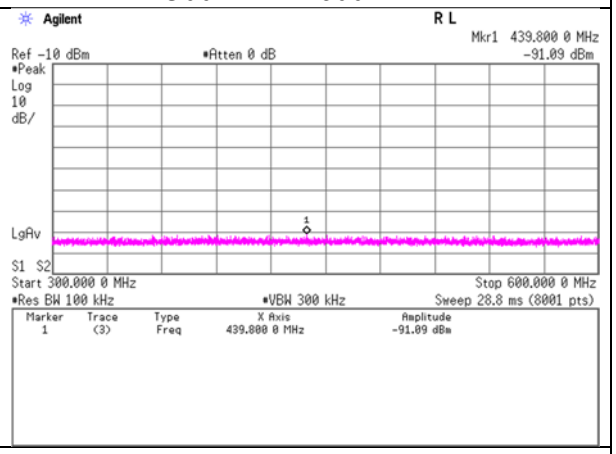
Spurious emissions (Conducted)

Report No.	12685243S-C-R1
Test place	Shonan EMC Lab. No.5 Shielded Room
Date	February 6, 2019
Temperature / Humidity	21 deg. C / 31 % RH
Engineer	Shiro Kobayashi
Mode	Rx (All GNSS)

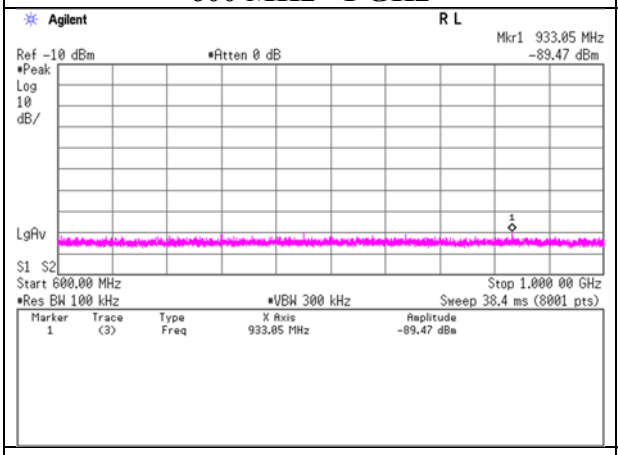
30 MHz - 300 MHz



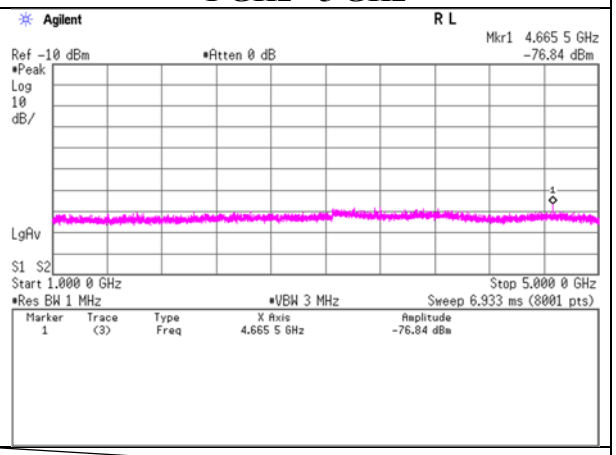
300 MHz - 600 MHz



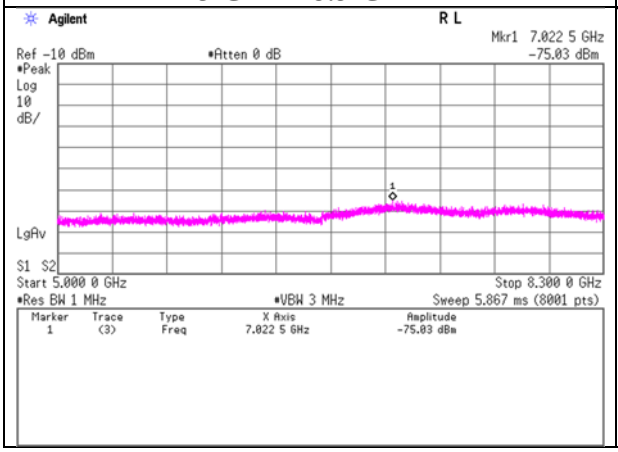
600 MHz - 1 GHz



1 GHz - 5 GHz



5 GHz - 8.3 GHz



Spurious emissions (Radiated)

Report No.	12685243S-C-R1	
Test place	Shonan EMC Lab.	
Semi Anechoic Chamber	No.1	No.1
Date	February 5, 2019	February 5, 2019
Temperature / Humidity	20 deg. C / 35% RH	20 deg. C / 35% RH
Engineer	Kazuya Noda	Kazuya Noda
	(Below 1 GHz)	(Above 1 GHz)
Mode	Rx (All GNSS)	

(Below 1 GHz)

No.	Freq.	Reading <PK>	SG Level	TX Ant.Gain	TX Loss	ERP Result	ERP Limit	Margin	Pola.	Height	Angle	TX Ant.Type	Comment
	[MHz]	[dBuV]	[dBm]	[dBi]	[dB]	[dBm]	[dBm]	[dB]		[cm]	[deg]		
1	73.012	38.80	-55.02	-21.31	1.87	-80.35	-57.00	23.3	Hori.	100	210	Dipol	RMS
2	86.917	37.76	-58.89	-16.40	2.07	-79.51	-57.00	22.5	Hori.	210	63	Dipol	RMS
3	196.606	37.61	-57.18	2.15	13.25	-70.43	-57.00	13.4	Hori.	100	339	Dipol	RMS
4	242.998	46.01	-54.49	2.15	13.70	-68.19	-57.00	11.1	Hori.	100	13	Dipol	RMS
5	417.790	40.15	-55.37	2.15	15.04	-70.41	-57.00	13.4	Hori.	100	349	Dipol	RMS
6	466.943	40.70	-52.87	2.15	15.44	-68.31	-57.00	11.3	Hori.	100	359	Dipol	RMS
7	600.002	35.00	-53.19	2.15	16.27	-69.46	-57.00	12.4	Hori.	200	233	Dipol	RMS
8	933.009	26.11	-56.53	2.15	18.16	-74.69	-57.00	17.6	Hori.	100	329	Dipol	RMS
9	51.115	33.68	-45.84	-29.49	1.57	-79.05	-57.00	22.0	Vert.	100	203	Dipol	RMS
10	73.001	47.70	-43.42	-21.31	1.87	-68.75	-57.00	11.7	Vert.	100	252	Dipol	RMS
11	86.942	39.73	-53.71	-16.39	2.07	-74.32	-57.00	17.3	Vert.	100	224	Dipol	RMS
12	319.487	42.16	-53.35	2.15	14.17	-67.52	-57.00	10.5	Vert.	100	255	Dipol	RMS
13	466.942	38.46	-52.30	2.15	15.44	-67.74	-57.00	10.7	Vert.	157	359	Dipol	RMS
14	600.002	37.02	-52.04	2.15	16.27	-68.31	-57.00	11.3	Vert.	100	290	Dipol	RMS
15	933.008	27.50	-52.95	2.15	18.16	-71.11	-57.00	14.1	Vert.	100	329	Dipol	RMS

Calculation:Result [dBm] = SG level [dB] + Tx Ant Gain [dBi] - Tx Loss (Cable + ATT) [dB] - 2.15 [dB]
Tx Ant: 120MHz turned Dipole(30 MHz-120 MHz), Dipole(120 MHz-1 GHz) / Rx-Ant: Biconical(25 MHz-200 MHz), Logperiodic(200 MHz-1 GHz)

(Above 1 GHz)

No.	Freq.	Reading <PK>	SG Level	TX Ant.Gain	TX Loss	EIRP Result	EIRP Limit	Margin	Pola.	Height	Angle	TX Ant.Type	Comment
	[MHz]	[dBuV]	[dBm]	[dBi]	[dB]	[dBm]	[dBm]	[dB]		[cm]	[deg]		
1	3595.522	41.36	-67.57	12.66	8.04	-62.95	-47.00	15.9	Hori.	154	122	Horn	RMS
2	3606.399	42.56	-64.35	12.66	8.05	-59.74	-47.00	12.7	Hori.	159	116	Horn	RMS
3	3505.223	41.37	-67.81	12.85	7.95	-62.91	-47.00	15.9	Vert.	140	187	Horn	RMS
4	3711.187	41.50	-66.49	12.73	8.16	-61.92	-47.00	14.9	Vert.	150	50	Horn	RMS

Calculation:Result [dBm] = SG level [dB] + Tx Ant Gain [dBi] - Tx Loss (Cable)[dB]
Tx Antenna: Horn(1 GHz-40 GHz) / Rx-Antenna: Horn(1 GHz-40 GHz)

APPENDIX 2: Test instruments

Test Instruments

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
CSG-12	AT	143677	Signal Generator	AGILENT	N5182B	MY53050599	2018/5/24	2019/5/31	12
KTS-07	AT	145111	Digital Tester	SANWA	PC500	7019232	2018/10/17	2019/10/31	12
SAT10-12	AT	151609	Attenuator	Weinschel Corp.	54A-10	81601	2018/3/22	2019/3/31	12
SCC-G37	AT	151614	Coaxial Cable	Junkosha	MWX241-01000KMSKMS/B	1612Q035	2018/12/25	2019/12/31	12
SCC-G38	AT	151615	Coaxial Cable	Junkosha	MWX241-01000KMSKMS/B	1612Q036	2018/12/25	2019/12/31	12
SDC-04	AT	156476	Default Import Type	KEYSIGHT	N9398C	MY46457609	2018/7/24	2019/7/31	12
SOS-09	AT	146318	Humidity Indicator	A&D	AD-5681	4061484	2018/12/5	2019/12/31	12
SPSC-01	AT	146251	Power Splitters/Combiners	Mini-Circuits	ZFSC-2-2500	U201700832	2018/4/20	2019/4/30	12
SSA-03	AT	145801	Spectrum Analyzer	AGILENT	E4448A	MY48250152	2018/8/30	2019/8/31	12
SSG-13	AT	158037	Signal Generator	Rohde & Schwarz	SMBV100A	262877	2018/8/30	2019/8/31	12
COTS-SEMI-5	RE	170932	EMI Software	TSJ	TEPTO-DV3(RE,CE,ME,PE)	-	-	-	-
KAT6-04	RE	144899	Attenuator	Inmet	18N-6dB	-	2018/12/25	2019/12/31	12
KHA-02	RE	144941	Horn Antenna	Schwarzbeck	BBHA9120D	230	2018/7/13	2019/7/31	12
KJM-09	RE	145929	Measure	KOMELON	KMC-36	-	-	-	-
SAEC-01(NSA)	RE	145597	Semi-Anechoic Chamber	TDK	SAEC-01(NSA)	1	2018/5/29	2019/5/31	12
SAF-01	RE	145003	Pre Amplifier	SONOMA	310N	290211	2019/2/5	2020/2/29	12
SAT3-09	RE	144959	Attenuator	JFW	50HF-003N	-	2018/8/23	2019/8/31	12
SBA-01	RE	145161	Biconical Antenna	Schwarzbeck	BBA9106	91032664	2018/6/5	2019/6/30	12
SCC-07	RE	145162	Coaxial Cable	FUJIKURA	5D2W	-	2018/9/14	2019/9/30	12

Test Instruments

Local ID	Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Calibration Due Date	Calibration Interval (Month)
SCC-A1/A3/A5/A7/A8/A13/SRSE-01	RE	144967	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12
SCC-A2/A4/A6/A7/A8/A13/SRSE-01	RE	144968	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141P	-/0901-269(RF Selector)	2018/4/9	2019/4/30	12
SCC-G43	RE	156380	Coaxial Cable	HUBER+SUNER	SUCOFLEX_104_E	SN MY 13406/4E	2018/7/10	2019/7/31	12
SCC-G16	RE	145177	Coaxial Cable	Suhner	SUCOFLEX 102	32704/2	2018/3/19	2019/3/31	12
SCC-G44	RE	168300	Coaxial Cable	HUBER+SUNER	SUCOFLEX 104	800070/4A	2018/3/28	2019/3/31	12
SDA-07	RE	145463	Dipole Antenna	Schwarzbeck	VHAP	1177	2018/8/27	2019/8/31	12
SDA-08	RE	145464	Dipole Antenna	Schwarzbeck	UHAP	1158	2018/8/27	2019/8/31	12
SHA-01	RE	145383	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-725	2018/7/23	2019/7/31	12
SLA-05	RE	145527	Logperiodic Antenna	Schwarzbeck	VUSLP9111B	193	2018/6/5	2019/6/30	12
SOS-01	RE	146316	Humidity Indicator	A&D	AD-5681	4062555	2018/10/25	2019/10/31	12
SRENT-20	RE	176115	Pre Amplifier	Agielnt	8449B	3008A02595	2018/12/18	2019/12/31	12
SSG-02	RE	146226	Signal Generator	AGILENT	E8257D-540	MY48051404	2018/3/8	2019/3/31	12
STR-01	RE	145790	Test Receiver	Rohde & Schwarz	ESU40	100093	2018/4/13	2019/4/30	12
STS-01	RE	145792	Digital Hitester	HIOKI	3805-50	80997812	2018/10/16	2019/10/31	12

***Hyphens for Last Calibration Date, Calibration Due Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

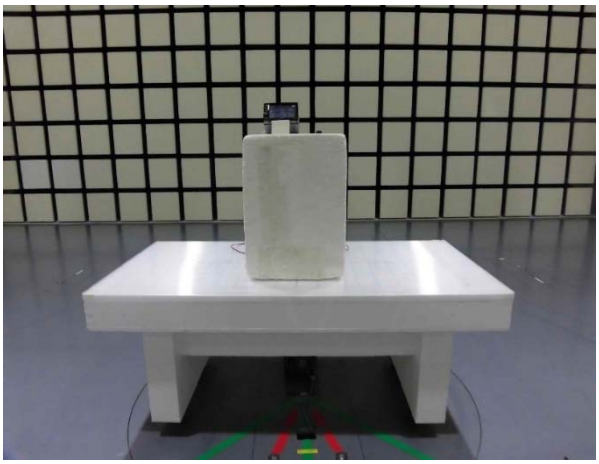
Test item:
AT: Antenna Terminal Conducted test
RE: Radiated emission test

APPENDIX 3: Photographs of test setup

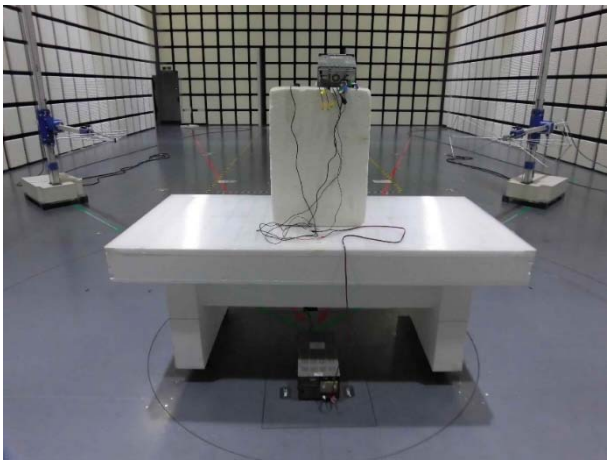
GUE adjacent frequency band selectivity performance

Spurious emissions (Radiated)

Below 1 GHz

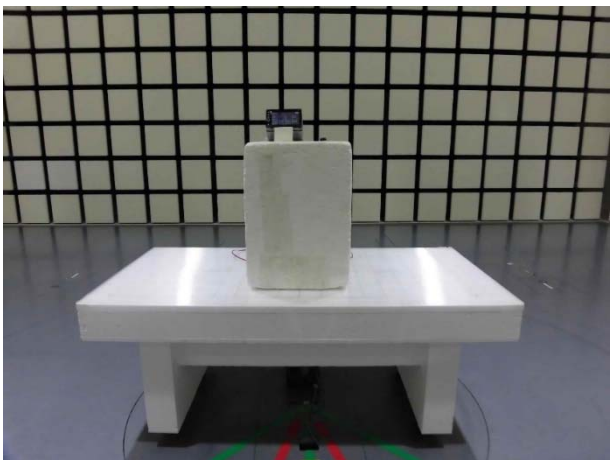


Front

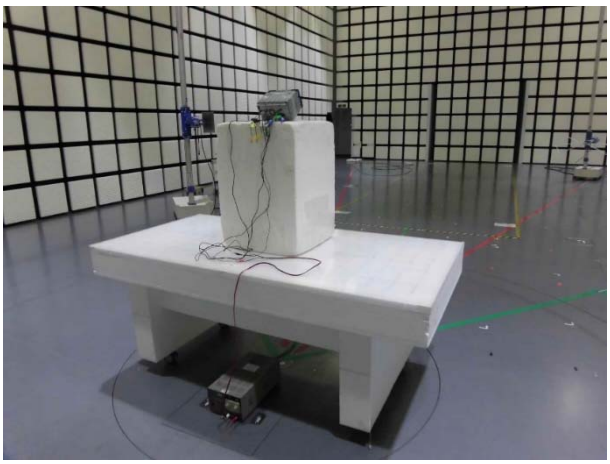


Rear

Above 1 GHz



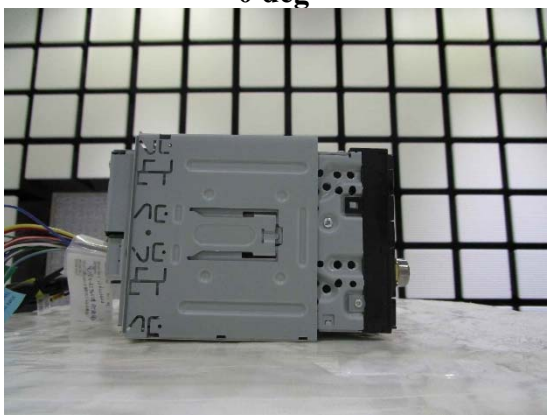
Front



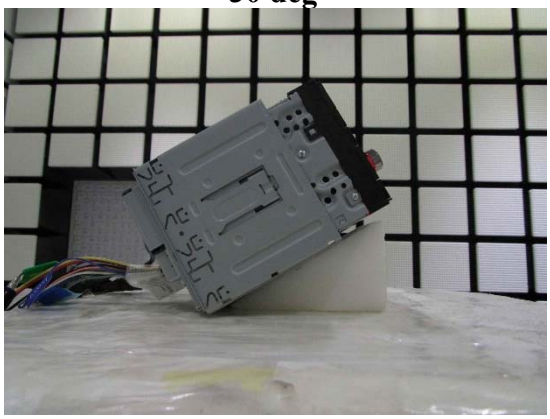
Rear

Worst Case Position

0 deg



30 deg



End of Report

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